

USSR

UDC 624.07:534.1

BELINSKIY, B. P., KOUZOV, D. P., and ChEL'TSOVA, V. D. Leningrad

"On the Diffraction of Acoustic Waves on Plates Joined at a Right Angle"

Moscow, Prikladnaya Matematika i Mekhanika, Vol 37, No 2, Mar - Apr, 73, pp 291-299

Abstract: This article examines 2-dimensional stable acoustical processes within an infinite space filled with fluid and bounded by sides at a right angle. The desired solution is the pressure at which the Helmholtz equation will hold within the area while some conditions with high-order derivatives will hold at the boundaries. The expressions for the boundary operators are not made specific. An exact representation is found for the pressure in the case in which the sound field is stimulated by a point source located within the fluid. A number of specific problems in the diffraction of hydroacoustic waves by two mutually perpendicular sheets are examined.

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USSR

UDC: 517.53:517.947.42

BELINSKIY, P. P.

"On the Order of Closeness of Spatial Quasiconformal Mapping to Conformal Mapping"

Moscow, Sibirskiy Matematicheskiy Zhurnal, Vol 14, No 3, May/Jun 73, pp 475-483

Abstract: The following theorem is proved: For sufficiently small values  $q - 1 \leq q_0 - 1$  there exists a constant  $K$  such that for any  $q$ -quasiconformal mapping  $y = f(x)$  of the sphere  $|x| < 1$  there exists a Moebius mapping  $L$  such that

$$|Lf(x) - x| \leq K(q - 1).$$

The quantities  $q_0$  and  $K$  depend only on the dimensionality of the space. In the proof, the author introduces the quantities of deviation of quasiconformal mapping from conformal which are invariant relative to auxiliary Moebius transformations and uses iterations of quasiconformal mappings with a small characteristic.

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172 012 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--INCREASING THE EFFICIENCY OF MAINS WATER HEATING SYSTEMS -U-  
AUTHOR--(04)-BELINSKIY, S.YA., GIRSHFELD, V.YA., KNYAZEV, A.M., LYUBIN,  
YE.S.  
COUNTRY OF INFO--USSR  
SOURCE--ELEKT. STANTSII (USSR), VOL. 41, NO. 3, P. 18-21 (1970)  
DATE PUBLISHED-----70  
SUBJECT AREAS--ENERGY CONVERSION (NON-PROPULSIVE), MECH., IND., CIVIL AND  
MARINE ENGR  
TOPIC TAGS--THERMOELECTRIC POWER PLANT, TURBINE HEAT EXCHANGER, HEATING  
ENGINEERING  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--3007/0501 STEP NO--UR/0104/70/041/003/0018/0021  
CIRC ACCESSION NO--AP0135964  
UNCLASSIFIED

2/2 012

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0135964

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE VARIOUS METHODS OF CONNECTING MAINS WATER HEATERS AND ACCUMULATORS IN THERMAL ELECTRIC POWER STATIONS WITH DIFFERENT TYPES OF TURBINE EQUIPMENT ARE ANALYZED. RECOMMENDATIONS ARE GIVEN ON WAYS OF IMPROVING MAINS WATER HEATING CIRCUITS.

UNCLASSIFIED

1/2 029 UNCLASSIFIED PROCESSING DATE--020CT70  
TITLE--STUDY OF SOME PROPERTIES OF HIGH MOLECULAR FIBRINOGEN TRYPTIC  
HYDROLYSIS PRODUCTS --U-  
AUTHOR--(05)-BELITSER, V.O., VARETSKA, T.V., TSINKALOVSKA, S.M.,  
POZDNYAKOVA, T.M., ORLOVSKA, N.M.  
COUNTRY OF INFO--USSR  
SOURCE--UKRAYNS'KIY BIOKHMICHNIY ZHURNAL, 1970, VOL 42, NR 2, PP 165-174  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--FIBRINOGEN, HYDROLYSIS, POLYMERIZATION, TRYPSIN, AMINO ACID,  
ELECTROPHORESIS  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1988/1677 STEP NO--UR/0300/70/042/002/0165/0174  
CIRC ACCESSION NO--AP0106423  
UNCLASSIFIED

2/2 029

UNCLASSIFIED

PROCESSING DATE--020QT70

CIRC ACCESSION NO--AP0106423

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IT IS KNOWN THAT HIGH MOLECULAR WEIGHT PRODUCTS FORMED DURING PROTEOLYTIC DEGRADATION OF FIBRINOGEN, INHIBIT THE FIBRIN MONOMER POLYMERIZATION. THE EXISTENCE OF COMPLEMENTARY STRUCTURES CHARACTERISTIC FOR THE SPECIFIC POLYMERIZATION CENTERS IN THESE FRAGMENTS MAY BE POSTULATED. HIGH MOLECULAR WEIGHT PRODUCTS, APPEARING DURING DEGRADATION OF FIBRINOGEN MOLECULE BY LOW CONCENTRATIONS OF TRYPSIN (ENZYME SUBSTRATE RATIO 1:2500 BY WEIGHT) WERE STUDIED. THEY WERE SEPARATED FROM TRYPTIC HYDROLYZATE OF FIBRINOGEN BY GEL FILTRATION ON SEPHADEX G 150. IT WAS SHOWN THAT DURING HYDROLYSIS LASTING FOR 120 HOURS AND MORE THESE PRODUCTS WERE GREATLY CHANGED IN THEIR ANTIPOLYMERIZING ACTIVITY, BEHAVIOUR IN GEL FILTRATION AND POLYACRYLAMIDE GEL ELECTROPHORESIS AND N TERMINAL AMINO ACIDS AS WELL. THE MOST ACTIVE AND AT THE SAME TIME THE LEAST HETEROGENEOUS PRODUCTS WERE PRODUCED DURING THE PROLONG HYDROLYSIS OF FIBRINOGEN BY TRYPSIN.

UNCLASSIFIED

1/2 033 UNCLASSIFIED PROCESSING DATE--11SEP70  
TITLE--OPTIMIZATION OF THE MECHANICAL PROPERTIES OF SYNTHETIC FILAMENT  
THREADS -U-  
AUTHOR--BELITSIN, M.N.  
COUNTRY OF INFO--USSR  
SOURCE--KHIM. VOLOKNA 1970, (1), 42-4  
DATE PUBLISHED-----70  
SUBJECT AREAS--MATERIALS  
TOPIC TAGS--SYNTHETIC FIBER, WEAR RESISTANCE, PLASTIC MECHANICAL PROPERTY,  
CAPRONE, POLYESTER RESIN/(U)KAPRON SYNTHETIC FIBER, (U)AMID SYNTHETIC  
FIBER, (U)LAVSAN SYNTHETIC FIBER  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAHE--1984/1809 STEP NO--UR/0183/70/000/001/0042/0044  
CIRC ACCESSION NO--AP0100383  
UNCLASSIFIED

2/2 033

UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0100383

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE MECH. PROPERTIES AND WEAR RESISTANCE OF KAPRON (I), ANID (II), AND LAVSAN (III) MULTIFILAMENT YARN WERE A FUNCTION OF THE THICKNESS OF THE ELEMENTARY FIBERS. THE MOST USEFUL COMBINATION OF MECH. PROPERTIES AND WEAR RESISTANCE WAS OFFERED BY I, II, AND III YARN FROM FIBERS OF 0.588-0.769 TEX(NO. 1300-1700).

UNCLASSIFIED



BELITSKIY, A. V.

SPS 0908

6-73

11-12b. THE POSSIBILITY OF OBTAINING CRYSTALS FROM SOLUTIONS WHICH ARE UNIFORM WITH RESPECT TO COMPOSITION

Article by N. D. Urolovsk, A. V. Belitskiy, Shchekolov, Novosibirsk, III Symposium on Problems of Solid State Physics, Poluprovodnikov Khimicheskoye i Fizicheskoye, 12-17 June, 1972, p 37

A study was made of the possibility of growing substituted crystals, which are uniform with respect to composition from solid solutions of the type of  $(\text{M}_1\text{M}_2)_x(\text{M}_3\text{M}_4)_{1-x}$  by selecting the cooling rate of the solution. For the case where the diffusion coefficients of the substituting components are appreciably larger than the diffusion coefficient of the unsubstituted component from the material balance equation in the solid and liquid phases, considering the temperature and concentration dependence of the diffusion coefficients, conditions were obtained the satisfaction of which ensures growth of uniform crystals.

From the solution of the diffusion equation, an expression was obtained for the cooling rate of the solution which depends on the nature of the solubility curve, the distribution coefficients of the substituted components, the diffusion coefficient and the volume of the solution. The conditions of selecting the temperature range of crystallization were defined in which growth of crystals which are uniform with respect to composition is possible.

BELITSKIY, A.V.

JPRS 59008  
6-73

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111-12. SELECTION OF THE GROWTH CONDITIONS OF CRYSTALS FROM SOLUTIONS

[Article by A. V. Belitskiy, N. D. Uraulyuk, Shchelkov, Novosibirsk, III  
Sibiriyskii nauchnyi tsentr, Novosibirsk, 1972, p. 36]

Some semiconductor materials are grown from solutions. In this case the  
process rate usually is determined by the diffusion of the crystal forming  
components to the crystallization front and is regulated by mixing.

From the joint solution of the diffusion equation and the material balance  
equation in the solid and liquid phases, the cooling rate was obtained as a  
function of the nature of the solubility curve, the magnitude of the introduced  
seed crystals, the volume of the solution and the mixing conditions. The  
cooling rate increases with an increase in the superheating of the solution,  
the diffusion coefficients and with a decrease in the solution volume. On  
mixing the solution by reverse rotation of the crystallizer, the angular velocity  
of the rotation increases with an increase in viscosity and volume of the solution.

An estimate was made of the thickness of the diffusion layer. The optimal  
cooling conditions and feeding conditions of the solution can insure an increase  
in the crystal growth rate by an order by comparison with the static crystal-  
lization conditions.

1/2 016 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--CORRELATION BETWEEN FIBRINOLYTIC ACTIVITY OF THE URINE AND BLOOD IN  
PATIENTS WITH ACUTE AND CHRONIC RENAL INSUFFICIENCY -U-  
AUTHOR--BELITSKAYA, G.A.  
COUNTRY OF INFO--USSR  
SOURCE--VRACHEBNOYE DELO, 1970, NR 4, PP 104-107  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--FIBRINOLYSIS, URINE, BLOOD, KIDNEY FUNCTION  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAHE--3002/1704 STEP NO--UR/0475/70/000/004/0104/0107  
CIRC ACCESSION NO--AP0129074  
UNCLASSIFIED

2/2 016

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0129074

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CONCENTRATION OF FIBRINOGEN, TOTAL PLASMA FIBRINOLYTIC ACTIVITY, LYSIS TIME OF THE EUGLOBULIN CLOT AND URINARY FIBRINOLYTIC ACTIVITY HAVE BEEN STUDIED IN 12 PATIENTS WITH ACUTE AND 34 PATIENTS WITH CHRONIC RENAL INSUFFICIENCY. RESULTS SHOWED A SHARP DECREASE OF THE FIBRINOLYTIC ACTIVITY OF THE BLOOD AND FIBRINOLYTIC PROPERTIES OF THE URINE IN THESE PATIENTS. THE POSSIBLE CAUSES OF THESE CHANGES ARE DISCUSSED. DECREASE OF URINARY FIBRINOLYTIC ACTIVITY IS CONSIDERED AN INDEX OF RENAL FUNCTION DISTURBANCE. FACILITY: KIEVSKIY MEDITSINSKIY INSTITUT.

UNCLASSIFIED

1/2 020 UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--MECHANISM OF THE SIMULTANEOUS REACTION OF BUTYL ISOCYANATE AND  
METHANOL WITH AERCSIL -U-  
AUTHOR-(U5)-KULIK, N.V., NEGIYEVICH, L.A., KURGAN, N.P., BELITSKAYA, G.F.,  
KACHAN, A.A.  
COUNTRY OF INFO--USSR  
SOURCE--TECH. EKSP. KHIM. 1970, 6(1), 55-60  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--ORGANIC ISOCYANATE, METHANOL, CHEMICAL REACTION RATE,  
ADSORPTION, SILICA  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--3002/1171 STEP NO--UR/0379/70/006/001/0055/0060  
CIRC ACCESSION NO--AP0128593  
UNCLASSIFIED

2/2 020

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0126593

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. REACTION RATES WERE MEASURED OF URETHANE (I) FORMATION FROM BUNCO (II) AND MEON IN THE GAS PHASE ON AERCSIL. THE HIGHEST RATE WAS ACHIEVED BY INTRODUCING A MIXT. OF MEON AND II ONTO THE CATALYST, DUE TO COMPLEX FORMATION. A LOWER RATE WAS OBTAINED ON INTRODUCING II FIRST. INTRODUCTION OF MEON FIRST LED TO THE LOWEST RATE DUE TO BLOCKING OF SILANOL GROUPS OF THE CATALYST BY MEON ADSORPTION. FACILITY: INST. KHIM. VYSOKOMOL. SOEDIN., KIEV, USSR.

UNCLASSIFIED

USSR

UDC 612.123-06:612.013-064

GAYEVSKAYA, M. S. and BELITSKAYA, R. A., Institute of Biomedical Problems, Moscow

"Content of Nonesterified Fatty Acids in Blood Plasma During Hypobiosis"

Moscow, Voprosy Meditsinskoy Khimii, No 3, 1971, pp 263-266

Abstract: Hypobiosis was induced in rats by combining artificial hibernation (administration of a lytic cocktail consisting of chlorpromazine, pipolphen, promedol, and d-tubocurarine) with external chilling. Hypobiosis was prolonged by transferring the animals to a chamber at 16°C where they remained for 24 to 29 hours. The level of nonesterified fatty acids rose the first day but steadily declined thereafter due to their gradual utilization for energy needs. Twenty-four hours after the artificial hibernation was terminated by warming the animals to 28°C, the content of nonesterified fatty acids returned to normal. Thus, nonesterified fatty acids seem to be a source of energy for nonhibernating animals like rats during hypobiosis and for some time thereafter.

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USSR

UDC 612.013-0647.015.3

GAYEVSKAYA, M. S., NOSOVA, YE. A., BELITSKAYA, R. A., and KURKINA, L. M.,

"Metabolism in Rat Tissues During Prolonged Artificial Hypobiosis"

Moscow, Byulleten' Eksperimental'noy Biologii i Meditsiny, No 4, 1971, pp 53-55

Translation: Prolongation of artificial hypobiosis in rats from 24 to 29 hours by combining premedication with external chilling did not result in significant shifts in carbohydrate-phosphorus metabolism in the brain, but intensified conformational changes in brain proteins. The glycogen content of the liver and muscles during 24 to 29 hours of hypobiosis was very low, but hyperglycemia persisted. After 29 hours of hypobiosis, some of the animals exhibited a sharp decrease in the content of nonesterified fatty acids in the blood.

Mortality among nonhibernating homeothermic animals in a state of artificial hypobiosis (maintenance of lowered vital activity against a background of hypothermia) is known to increase when this state is sustained for more than one day. There are indications that death of animals is related to the development of noncoordination of the metabolic processes in the tissues (14, 22).

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GAYEVSKAYA, M. S., et al., Byulleten' Eksperimental'noy Biologii i Meditsiny No 4, 1971, pp 53-55

Metabolic changes in the tissues of rats kept in a state of hypobiosis for up to one day were investigated by us in earlier studies (3, 5, 9, 11). The purpose of this work was to study metabolic shifts in the brain, liver, muscles, and blood of rats when the state of hypobiosis is lengthened from 24 to 29 hours.

#### Procedure

Experiments were performed on male rats weighing 150 to 250 g. Artificial hypobiosis was induced by Timofeyev's method (8, 12). After injection of a lytic mixture and tubocurarine, the rats were placed in a ventilated chamber at  $-10^{\circ}\text{C}$  where their body temperature dropped to  $18$  to  $20^{\circ}\text{C}$ . The animals were then transferred to a chamber where the temperature was  $16$  to  $18^{\circ}\text{C}$  and their body temperature was maintained at  $18$  to  $22^{\circ}\text{C}$  for 24 to 29 hours.

After the animals were decapitated, the electrophoretic motility of soluble proteins (7) in brain tissues and their ultraviolet absorption spectra (13) were determined. Blood sugar was determined by the Hagedorn-Jensen method; ketone bodies (2) and nonesterified fatty acids (19) were also determined. Other studies were conducted in tissues after they were frozen in situ in liquid nitrogen. Total amide groups of proteins (6), total content of ATP and ADP (from readily hydrolyzable phosphorus), content of creatine

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USSR

GAYEVSKAYA, M. S., et al., Byulleten' Eksperimental'noy Biologii i Meditsiny  
No 4, 1971, pp 53-55

phosphate (1), inorganic phosphorus (21), glucose (10), glycogen (18), and lactic acid (15) were determined in brain tissue. Glycogen was determined in the liver and muscles (4) and the content of glucose (10) and of lipids (16) was determined in the liver.

Results

Prolongation of the period of hypobiosis from 24 to 29 hours did not produce any significant shifts in carbohydrate-phosphorus metabolism in the brain.

Such shifts as occurred indicated that conformational changes in brain proteins intensified as hypobiosis continued. However, the insignificance of the shifts noted both in carbohydrate-phosphorus metabolism and in brain proteins suggest that they could hardly have been a major factor in the death of animals with the given duration of hypobiosis.

Extension of hypobiosis from 24 to 29 hours did not produce significant shifts in the amount of glucose or glycogen in the liver. There was a slight but significant decrease in the amount of lipids. The glycogen content of the muscles after 29 hours of hypobiosis remained as low as after 24 hours.

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USSR

GAYEVSKAYA, M. S., et al., Byulleten' Eksperimental'noy Biologii i Meditsiny  
No 4, 1971, pp 53-55

Hyperglycemia persisted after the period of hypobiosis was lengthened. It could have been caused either by glycogenesis or by the very low utilization of glucose by the tissues, which changed after chilling to the preferential utilization of fat, as is the case in supercooling and hibernation (17, 20). Other investigators (22) detected hypoglycemia when they tried to prolong hypobiosis in rats, but we did not. After 29 hours of hypobiosis, the blood content of ketone bodies remained high, a phenomenon consistent with the idea of preferential utilization of fat during hypothermia.

The content of nonesterified fatty acids in blood plasma after 29 hours was little different from that found at the end of 24 hours of hypobiosis in 7 rats but was sharply lower in 3. These particular rats were in the most serious condition: respiration was infrequent, barely perceptible, and muscle tone was very weak.

Thus, of the indices of metabolism studied, only the insufficiency of nonesterified fatty acids in the blood could be directly related to the death of the rats following the prolongation of hypobiosis for more than one day.

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1/2 020  
UNCLASSIFIED  
TITLE--EFFECT OF THE RATE OF ANTIMONY AND INDIUM IONS DISCHARGE ON THE  
PHASE COMPOSITION OF THE ALLOY -U-  
AUTHOR-(03)-BELITSKAYA, T.B., KOCHEGAROV, V.M., CHERNOV, YU.I.  
COUNTRY OF INFO--USSR  
SOURCE--ELEKTROKIMIYA 1970, 6(2), 215-17  
DATE PUBLISHED-----70  
SUBJECT AREAS--MATERIALS  
TOPIC TAGS--ANTIMONY ALLOY, INDIUM ALLOY, ION, INTERMETALLIC COMPOUND,  
COVALENT BONDING, ELECTRODEPOSITION  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1988/0691  
CIRC ACCESSION NO--AP0105667  
STEP NO--UR/0364/70/006/002/0215/0217  
UNCLASSIFIED

2/2 020

UNCLASSIFIED

PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0105667

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CODEPOSITION OF SB AND IN WAS STUDIED FROM 4 GLYCEROL SOLNS. CONTG. A TOTAL METAL ION CONC. OF 0.4 M WITH IN (AS INCL SUB3) EQUALS 0.35, 0.3, 0.2, AND 0.1 M AND SB AS K(SBO)C SUB4 H SUB4 O SUB6.0.5 MINUS H SUB2 O AS THE REMAINDER AND KOH EQUALS 70 G-1. SOLNS. CONTG. HIGH CONCNS. OF SB GAVE DEPOSITS OF ESSENTIALLY PURE SB. BY LOWERING THE SB ION CONC. AND INCREASING THE CATHODIC POTENTIAL, THE INDIVIDUAL DISCHARGE CURRENTS WERE APPROX. EQUAL; THUS, THE DEPOSITS CAN BE MADE TO CONTAIN SB-IN ALLOYS. HOWEVER, CHANGING THE DEPOSITION RATE DID NOT PLAY AN IMPORTANT ROLE TOWARD THE FORMATION OF THE INTERMETALLIC INSB COMPD. WITH COVALENT BONDS.

UNCLASSIFIED

2/2 027

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0139012

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE INTENSITY OF METABOLISM OF POLYCYCLIC HYDROCARBONS BY NORMAL MOUSE EMBRYONAL FIBROBLASTS IN VITRO DECREASED IN THE FOLLOWING SEQUENCE: BENZ,(ALPHA)PYRENE AND BENZ(ALPHA)ANTHRACENE FOLLOWED BY DIBENZ(AH)ANTHRACENE AND BENZO(GHI)PERYLENE, AND LESS SIGNIFICANTLY BY 7,12,DIMETHYLBENZ(ALPHA)ANTHRACENE, PYRENE, AND PERYLENE. THIS SEQUENCE DID NOT CORRELATE WITH THEIR SOLY. IN CELLULAR LIPIDS, THEIR CYTOTOXICITY, OR THEIR CARCINOGENIC ACTIVITY, BUT SEEMED TO DEPEND UPON THEIR ABILITY TO INDUCE MULTIFUNCTIONAL OXIDASES IN THE CELLS.

FACILITY: INST. EXPTL. CLIN. ONCOL., MOSCOW, USSR.

UNCLASSIFIED

1/2 029 UNCLASSIFIED PROCESSING DATE--09OCT70  
TITLE--METABOLIC BREAKDOWN OF BENZO(A)PYRENE BY CELLS OF DIFFERENT MAMMALS  
IN VITRO AND THE TOXIC EFFECT OF POLYCYCLIC HYDROCARBONS ON THESE CELLS  
AUTHOR--(05)-BELITSKIY, G.A., VASILYEV, YU.M., IVANOVA, O.YU., LAVROVA,  
N.A., PRIGOZHINA, YE.L.  
COUNTRY OF INFO--USSR

SOURCE--VOP. ONKOL. 1970, 16(2), 53-8

DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--HYDROCARBON, METABOLISM, TOXICOLOGY, CAT, CELL PHYSIOLOGY,  
EMBRYOLOGY, LEUKOCYTE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1986/1689

STEP NO--UK/0506/70/016/002/0053/0058

CIRC ACCESSION NO--AP0103455

UNCLASSIFIED

2/2 029

UNCLASSIFIED

PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AP0103455

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. RAT CELLS SENSITIVE TO THE TOXIC ACTION OF HYDROCARBONS ACTIVELY METABOLIZED BENZO(A)PYRENE (I). METABOLISM WAS SLOWER IN PIG AND CAT CELLS WHICH WERE MORE RESISTANT TO THE TOXIC ACTION OF I AND 7,12-DIMETHYLBENZ(A)ANTHRACENE. NORMAL EMBRYONIC FIBROBLASTS CELLS IN VITRO AND LEUKOCYTES FROM THE PERIPHERAL BLOOD OF HEALTHY HUMANS WERE ALMOST INSENSITIVE TO THE TOXIC ACTION OF THESE HYDROCARBONS AND METABOLISM OF I DEVELOPED MORE SLOWLY. THE SENSITIVITY OF CELLS TO THE TOXIC ACTION OF THE HYDROCARBONS SEEMS TO DEFINITELY CORRELATE WITH THEIR ABILITY TO METABOLIZE THESE COMPOS.

FACILITY: INST. EXP. CLIN. ONCOL., MOSCOW, USSR.

UNCLASSIFIED



USSR

UDC: None

BELITSKIY, G. M.

"Piezooptical Accelerometer"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 27, 1971, p 151, No (11)351160

Abstract: The equipment consists of a light source, a sensing element connected with an inertial mass, a phase plate, an analyzer, and a light sensor. To improve the sensitivity, the sensing element is a disc with a hole in the center. The light source, surrounded by a polarizer, is placed in this hole. A profile and plan cross section view of the device is reproduced.

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USSR  
Adsorption

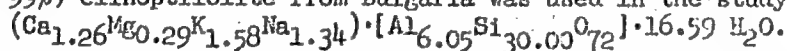
USSR

BELITSKIY, I. A., SHCHERBATYUK, N. YE., KRASNOVA, L. V., FILIZOVA, I. D.,  
TYURINA, YE. F.

"Sorption Properties of Cation-Substituted Forms of Clinoptilolite"

Novosibirsk, Izvestiya Sibirskogo Otdeleniya Akademii Nauk SSR -- Seriya  
Khimicheskikh Nauk, No 1, 1973, pp 84-87

Abstract: This paper is a continuation of the study of the sorption and molecular-screen properties of high-silicon heulandite-clinoptilolite, the natural forms of which were investigated previously [I. A. Belitskiy, et al., Izv. Sib. Otd. AN SSSR, ser. khim. nauk, No 14, vyp. 6, 1971]. Just as before, monomineral (~99%) clinoptilolite from Bulgaria was used in the study:



The study was made of the sorption properties of the clinoptilolite with respect to water vapor and methanol and six samples of cation-sensitive forms obtained by ion exchange based on clinoptilolite with lithium, sodium, potassium, rubidium, cesium and thallium ions as the "consolidated" cations.

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USSR

HELITSKIY, I. A., ET AL., Izvestiya Sibirskogo Otdeleniya Akademii Nauk SSR --  
Seriya Khimicheskikh Nauk, No 1, 1973, pp 84-87

A reduction in the sorptive power was discovered going from the lithium cation form to the cesium cation form. This is connected with the reduction and degree of hydration of the cations increasing in size and also with a decrease in the free volume of the cavities.

The parameters of the microporous structure of the indicated sorbents were calculated on the basis of the Dubinin-Radushkevich theory of volumetric filling of the micropores. The lithium, sodium and potassium forms of clinoptilolite are characterized by the greatest sorption volume equal to 0.22-0.110.

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USSR

UDC 539.171.017

ABDULLAYEV, A. M., AZIMOV, S. A., BEYSEMBAYEV, R. U., BELITSKIY, M. T.,  
MULLIZHANOV, E. ZH., MYALKOVSKIY, V. M., TALIPOV, T. A., TILLAYEV, T.,  
UMEROV, R., KHEN, E., and YULDASHBAYEV, T. S.

"Study of Characteristics of Inelastic Interactions of Cosmic-Ray Particles  
in the  $10^{11}$  to  $10^{12}$ -ev Energy Range"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, Vol 35, No 10,  
Oct 71, pp 2065-2068

Abstract: Experiments that were performed at the high-altitude test station  
(3,200 m.) at Kum-Bel' in Uzbekistan are described. The purpose of the exper-  
iments was to investigate the angle of arrival and the energy characteristics  
of interactions of pions and nucleons with light and heavy nuclei at  $2 \times 10^{11}$   
to  $2 \times 10^{12}$  ev and the mechanism of generating muons at energies above  $2 \times 10^{12}$   
ev. Equipment consisted of spark chambers, located above and below the target  
(paraffin wax, carbon, and iron), a Cerenkov spectrometer of full absorption,  
and an ionization calorimeter. This complex method of measurements was found  
convenient for use in various modes of operation. A detailed description of  
various parts of the installation and their disposition is given in the paper.  
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- 123 -

USSR

ABULLAYEV, A. M., et al., Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, Vol 35, No 10, Oct 71, pp 2065-2068

Joint operation of ionizing calorimeters and spark chambers is normally difficult because of the need for high voltage on the calorimeter electrodes, combined with the time lag of the input pulse from the spark chambers, amounting to over 20 microseconds. This difficulty was avoided in the present experiments by storing pulses in memory cells, with the subsequent input of a high-voltage pulse of about 120 kv. Operation was controlled by a master-pulse, prior to which all parts of the equipment were kept inoperative.

Results of 200 hours of the joint operation of a Čerenkov spectrometer and ionizing calorimeter, with graphite used as the target, have been processed so far. For analysis, showers with energy above  $1.5 \times 10^{11}$  ev were selected, 130 of them having been observed. The ratio of charged to neutral nucleons were determined and, from it, the fraction of charged pions of the total nucleus-active stream of particles. The inelastic coefficient for the formation of  $\pi^0$ -mesons was computed from the experiments related to the interaction of neutral particles with nuclei of graphite.

It is concluded that the combination of ionizing calorimeter with Čerenkov spectrometer of full absorption for the simultaneous determination of energy of primary particles made it possible to determine the fraction of

2/3

USSR

ABULLAYEV, A. M., et al., Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, Vol 35, No 10, Oct 71, pp 2065-2068

energy supplied by the ionizing particles  $\tilde{\gamma}$ , since a Čerankov spectrometer measures only the energy emitted by relativistic particles. It was found that for the mean energy of primary particles of 350 Gev the energy part lost on nuclear fissions in the spectrometer, with  $\text{CCl}_4$  as the light emitter, is  $\tilde{\gamma} = 0.25$ ,

CSO: 1862 -W

- END -

3/3

- 124 -

USSR.

UDC 629.78.002.3

BELITSKIY, M. Ye., BATURIN, G. T., GAYDARENKO, A. L., GERMANCHUK, F. K.,  
SKRIPKA, V. F.

"Study of the Chemical Stability of Certain Nonmetallic Components of Friction Materials at High Temperatures"

Sb. nauch. tr. Kiyev. in-t inzh. grazhd. aviatsii (Collection of Scientific Works of the Kiev Institute of Civil Aviation Engineers), 1971, No. 2, pp 64-67 (from RZh-41. Raketostroyeniye, No 11, Nov 72, Abstract No 11.41.189)

Translation: Studies of the chemical stability of widely used, promising nonmetallic components and solid lubricants of friction metalloceramic materials are described. Recommendations are made as to their application as high-temperature solid lubricants for friction materials of heavy-load braking devices: boron nitride, 2-calcium fluoride and synthetic mica. 6 ill., 1 table, 7 ref. Resume.

1/1

USSR

UDC: 621.438

BELITSKIY, M. Ye., and KUZNETSOV, Ye. I.

"Method and Some Results of the Investigation of UMB-4c Packing Material in the Products of Combustion of Aviation Fuel"

Kiev, Fiziko-Khimicheskaya Mekhanika Materialov, Vol 7, No 5, 1971, pp 68-71

Abstract: It was observed that the heat resistance of the UMB-4c packing material operating in gas turbines is higher than under laboratory conditions in air. This is believed to be due to the more corrosive action of air which contains more oxygen than the products of combustion of aviation fuel.

In order to simulate the actual conditions in the gas turbine an apparatus was used where the material was tested in the atmosphere of gas having essentially the same chemical composition as the products of combustion of aviation fuel.

1/2



USSR

BELITSKIY, M. Ye., et al, Fiziko-Khimicheskaya Mekhanika Materialov,  
Vol 7, No 5, 1971, pp 68-71

The tests showed that the increase in weight due to corrosion  
was higher, Brinell hardness and bending strength lower in air  
than in the gas simulating the products of combustion.

2/2

- 75 -

USSR

UDC 615.332.015.42:576.851.31

BELIZHENKO, V. D., VED'MINA, YE. A., YERMOL'YEVA, Z. V., and YEFIMTSEVA, YE. P., Chair of Biochemistry, Vitebsk Medical Institute and Chair of Microbiology, Central Institute for Advanced Training of Physicians, Moscow

"Effect of Antibiotics (Neomycin, Monomycin, and Kanamycin) on the Synthesis of Protein and Nucleic Acid in Intact NAG Vibrio Cells"

Moscow, Antibiotiki, No 12, 1971, pp 1085-1088

Abstract: Study of the effect of antibiotics on protein synthesis in intact NAG vibrio (strain 1115) cells showed that neomycin, monomycin, and kanamycin at concentrations of 10, 50, and 500  $\mu$ g/ml inhibit the incorporation of  $1\text{-C}^{14}$ -glycine into the protein fraction soluble in phenol, but stimulate its incorporation into the fractions of RNA, DNA, and proteins insoluble in phenol. The degree of inhibition and stimulation varied directly with the dose of antibiotic. The stimulating effect of the antibiotics on the incorporation of labeled glycine into nucleic acids and phenol-insoluble protein fraction is attributed to the competitive relationships resulting from the utilization by the bacterial cells of amino acids to synthesize proteins and nucleic acids. When protein synthesis is inhibited, the free amino acids can be more fully utilized for nucleic acid synthesis. The stimulation of incorporation of  $1\text{-C}^{14}$ -glycine into the phenol-insoluble proteins suggest that the synthesis of this protein fraction is not sensitive to neomycin, monomycin, or kanamycin. 1/1

BELKANIYA, G. S.

space physiology

UDC 61:885+612:886+612.626.4/.016.47:531.5

50.3445 63801  
12 AUG 71

IMPORTANCE OF THE MOTOR AND VESTIBULAR ANALYZERS AND FRONTAL HYPOTHALAMUS  
IN COMPENSATING A GRAVITATIONAL LOAD DURING ORTHOSTASIS

(Great Physiology)  
Article by G. S. Belkaniya, Moscow, Izvestiye Akademii Nauk SSSR, Seriya Biologiya i Medicina,  
Moscow, Vol. 3, No. 3, 1971, pp. 11-36, submitted 12 May 1969]

**Abstract:** In experiments on intact cats and also against a background of curarization, bilateral vestibular deafferentation and electrocoagulation of the frontal hypothalamus, it was possible to determine the phase nature of changes in respiration, arterial pressure and cerebral bioelectric activity during orthostasis. There is a distinct dependence between the rate of development of orthostatic collapse and the nature of the primary vascular reaction; this determines its prognostic importance. Elimination of the vestibular motor analyzer and electric coagulation of the frontal hypothalamus sharply reduce the gravitational function during orthostasis. Orthostatic tolerance is regarded as a special manifestation of the general mechanism of body spatial orientation.

Changes in body position in the vertical plane, being the most common gravitational stresses to which man is exposed, are used in modeling a gravitational load when the body is in a vertical position with the head up (Yu. Ye. Kostelenko, et al.; Yu. Ye. Kostelenko, and others). An orthostatic position is regarded as the effect of a positive gravitational load in a "head-legs" direction. The collapse observed at this time develops due to a decrease in the capacity of the cardiovascular system to maintain an adequate cerebral circulation.

Many authors have studied respiratory and circulatory disorders arising in an orthostatic position with the head up (M. A. Zakhar'yevskaya; Ye. I. Lyublin; L. R. Fok; S. S. Vayl; V. G. Lyubko; Nylin and Levander; Dietlein, et al.). Recently interest in this problem has increased still further. This is attributable to the development of space medicine, one of whose primary missions is a study of the compensatory capabilities of

1/2-015 UNCLASSIFIED PROCESSING DATE--16OCT70  
TITLE--DETERMINATION OF BETA SITOSTEROL IN VEGETABLE RAW MATERIAL -U-  
AUTHOR--(05)-KSENOFONTOVA, YE.V., MUKHINA, M.V., KHALETSKIY, A.M.,  
KAGANOVICH, F.L., BELKEVICH, P.I.  
COUNTRY OF INFO--USSR  
SOURCE--VESTSI AKAD. NAVUK BELARUS. SSSR, SER. KHIM. NAVUK 1970, (1),  
103-5  
DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

PIC TAGS--STEROL, PROCESSED PLANT PRODUCT, SOLVENT EXTRACTION, CHEMICAL  
PURIFICATION, SPECTROPHOTOMETRY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

COPIES/REEL/FRAME--1997/0190

STEP NO--UR/0419/70/000/001/0103/0105

RC ACCESSION NO--AP0119186

UNCLASSIFIED

2/2 015 UNCLASSIFIED PROCESSING DATE--16OCT70  
RC ACCESSION NO--AP0119186  
BTRACT/EXTRACT--(U) GP-0- ABSTRACT. DISSOLVE PHYTOSTEROL (0.03 G) IN  
CH SUB2 CL SUB2 AND APPLY ON THE STARTING LINE OF A LAYER OF UNBOUND AL  
SUB2 O SUB3. DEVELOP WITH ETO SUB2 AND LOCATE THE BETA SITOSTEROL IN UV  
LIGHT. ELUTE IT FROM THE POWDER WITH HOT ME SUB2 CO. EVAPORATE ME SUB2  
CO AND DISSOLVE RESIDUE IN 25 ML ACOH. TO 5 ML ADD 2 ML 0.5PERCENT  
BENZOYL PEROXIDE AND BOIL 3-5 MIN. AFTER COOLING, CAREFULLY ADD 0.5 ML  
CONCD. H SUB2 SO SUB4 AND DIL. TO 25 ML WITH ACOH. MEASURE ABSORBANCE  
AT 690 MMU OR WITH A RED FILTER. THE LINEAR RANGE IS 0-280 MUG PER ML.  
THE METHOD IS USED TO ANALYZE UNSAPONIFIABLE ROSINS FROM PEAT WAXES.  
FACILITY: LENINGRAD. KHIM.-FARM. INST., LENINGRAD, USSR.

USSR

UDC: 681.332.65

ASOYAN, L. M., BELKIN G. G., GRIGORYAN, R. Kh., KARANYAN, K. Kh., ABADZHYAN, S. S., GEVORKYAN, S. G.

"Parallel Barker Code to Parallel Binary Code Converter"

USSR Authors' Certificate No 249762, Filed 2 April 1968, Published 15 January 1970 (Translated from Referativnyy Zhurnal Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 10, 1970, Abstract No 123P, by L. Sh.)

Translation: The converter suggested contains a register, each digit of which with the exception of the low-order digit, is made of two flip-flops connected with buses corresponding to the subdigits of Barker code and logic circuits. The ones and zeros outputs of the flip-flops of each digit are connected to two pairs of AND circuits respectively. The outputs of the AND circuits of each pair are connected through an OR circuit and delay line to the inputs of the second flip-flop of the same digit. The output of the OR circuit connected to the ones output of the triggers of the digit in question is connected also to the AND circuits connected to the outputs of the second flip-flop of the next digit. The output of the OR circuit connected to the zero outputs of the flip-flops is connected to the AND circuit which is connected to the outputs

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USSR

ASOYAN, L. M., USSR Authors' Certificate No 249762, Filed 2 April 1968, Published 15 January 1970 (Translated from Referativnyy Zhurnal Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 10, 1970, Abstract No 123P, by L. Sh.)

of the first flip-flop of the next digit. The ones outputs of the low-order digit flip-flop and the second flip-flops of the next digits are used as outputs corresponding to binary code. The circuit suggested combines the functions of a Barker code to parallel binary code converter with the functions of memorization of the binary code. One illustration.

2/2

USSR

SOLYAKOV, S. P., BELKIN, G. I., TATAKIN, A. N., NACHAYEV, V. M., ZOBNIN, S. I.,  
ZYEY, N. M., IVANOV, A. B., VUKOLOV, V. V., SVALOV, G. N., DEYATKIN, V. N.,  
ALEKSANDROV, V. A., GRIBOV, V. I.

"Method of Processing Slimes from Electrolytic Production of Magnesium"

Author's Certificate No 278126, filed 11/02/69, published 18/11/70. (Translated  
from Referativnyy Zhurnal Metallurgiya, No 2, 1972, Abstract No 2G185).

Translation: In order to use the slime for production of Mg, it is fed from the  
electrolyzers to chlorinators together with the depleted  $MgCl_2$  electrolyte  
in the form of a pulp containing 1-10% MgO and 5-25%  $MgCl_2$ . The chlorinators  
also receive the Cl-Mg raw material and  $Cl_2$ , after which the electrolyte,  
enriched with  $MgCl_2$ , is fed to the electrolyzers.

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USSR

UDC 669.721.042.6(088.8)

TAGAKIN, A. N., KORZNIKOV, V. M., ~~BELKIN, G. I.~~, ALONTSEV, V. S., PROVODNIKOV, A. A., MAZUROV, G. A., TITAYEV, I. A., PUFINA, O. A., MATSUY, N. V., BOCHKAREV, G. V., NAGIBIN, V. M.

"Method of Processing of Magnesium Ingots"

USSR Author's Certificate No 313908, filed 16/03/70, published 10/11/71;  
(Translated from Referativnyy Zhurnal, Metallurgiya, No 5, 1972, Abstract  
No 5 G248 P by G. Svodtseva).

Translation: A method of processing of Mg ingots including transportation, cooling, mechanical working, washing, etching, drying and covering with a protective layer is proposed. In order to reduce the labor expenditures for the process and process time, the ingots are subjected to forced cooling to 450-100°, mechanically worked during transportation, and washed at 350-100°. This reduces labor consumption, decreases the time of the process, and increases the productivity of labor by 40-80%.

1/1

1/2 013 UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--LEUCO 1,4,5,8 TETRAHYDROXYANTHRAQUINONE -U-  
AUTHOR-(05)-BELKIN, I.D., BRIGICER, YU.Z., MASLOSH, V.Z., SANKO, L.G.,  
POTIRAY, R.YE.  
COUNTRY OF INFO--USSR  
SOURCE--U.S.S.R. 266,777  
REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI 1970,  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--CHEMICAL PATENT, CHEMICAL SYNTHESIS, ANTHRAQUINONE, NITRATION,  
HYDROXYL RADICAL  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--3004/1310 STEP NO--UR/0482/70/000/000/0000/0000  
CIRC ACCESSION NO--AA0132076  
UNCLASSIFIED

2/2 013

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AA0132076

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. LEUCO 1,4,5,8  
TETRAHYDROXYANTHRAQUINONE (I) WAS PREPD. FROM 1,8 DIHYDROXYANTHRAQUINONE  
BY NITRATION, REDN. OF THE RESULTANT NITRO DERIV. WITH NA SUB2 S IN THE  
PRESENCE OF NA SUB2 S SUB2 O SUB4.2H SUB2 O, FILTRATION, RINSING,  
HYDROLYSIS IN THE PRESENCE OF AQ. NAOH AND NA SUB2 S SUB2 O SUB4.2H SUB2  
O, AND SEPN. OF I.

UNCLASSIFIED

USSR

UDC 621.372.061

B  
BELKIN, M. K.

"Signal/Noise Ratio at the Output of a Superregenerative Receiver"

Vesti. Kievsk. politekhn. in-ta Ser. radiotekhn. i elektroakust (Kiev Polytechnical Institute Vestnik. Radiotechnical and Electroacoustic Series), 1969, No 6, pp 72-75 (from RZh-Radiotekhnika, No 8, Aug 70, Abstract No 8A129)

Translation: This article contains an analysis of worsening of the noise characteristics of a superregenerator by comparison with an ordinary receiver when using pulse signals with length exceeding the superization period. It is demonstrated that the degree of worsening increases with the depth of superization. Under other equal conditions, the linear detector at the superregenerator output gives a better signal/noise ratio than quadratic detectors. There are three illustrations and a seven-entry bibliography.

1/1

UNCLASSIFIED

PROCESSING DATE--16OCT70

1/2 013  
TITLE--DIFFERENTIAL CROSS SECTIONS FOR QUADRANGULAR GRAPHS IN SOME DIRECT  
NUCLEAR REACTIONS -U-

AUTHOR--(03)-MAGZUMOV, E.ZH., NEUDACHIN, V.G., BELKIN, M.S.

COUNTRY OF INFO--USSR

SOURCE--YAD. FIZ. 1970, 11(3), 589-97

DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--DIFFERENTIAL CROSS SECTION, PROTON BAMBARDMENT, TRITON  
BOMBARDMENT, GRAPHIC TECHNIQUE, NUCLEAR REACTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1991/1041

STEP NO--UR/0367/70/011/003/0589/0597

CIRC ACCESSION NO--AP0110731

UNCLASSIFIED

2/2 013

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0110731

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. RESULTS OF THE CALCN. OF THE DIFFERENTIAL CROSS SECTIONS OF (T, P) AND (P, P PRIME) REACTIONS, DESCRIBED BY QUADRANGULAR GRAPHS, USING DISTORTED WAVES, ARE GIVEN. THE PROBLEM OF THE DEPENDENCE OF THE CROSS SECTION UPON THE ENERGY OF INCIDENT PARTICLES WAS STUDIED. THE ABS. VALUES OF CROSS SECTIONS WERE ESTD. ON THE BASIS OF A SIMPLE "OSCILLATOR" APPROXN. BY RENORMALIZATIONS OF ONE PARTICLE REDUCED WIDTHS CALCD. FROM THE EXPTL. DATA ON (D, P) AND (T, D) REACTIONS. FACILITY: INST. YAD. FIZ., MOSK. GOS. UNIV., MOSCOW, USSR.

UNCLASSIFIED

BELKIN, V. I.

SPACE BIOLOGY

UDC 612.333-06:612.273.1

EFFECT OF THIRTY-DAY CONFINEMENT OF RATS IN AN ATMOSPHERE WITH AN INCREASED OXYGEN CONTENT ON THE ELIMINATION OF SOME CASEOUS PRODUCTS OF VITAL FUNCTIONS

Article by V. V. Kuzgov, B. I. Abdin, V. I. Belkin, L. T. Fedukhina, and T. A. Lefarevna; Moscow, *Kosmicheskaya Biologiya i Meditsina*, Russian, Vol. 6, No. 5, September-October 1972, submitted for publication 6 November 1970, pp 3-5]

**Abstract:** Experiments on white male rats have shown that 30-day exposure of the animals in a hyperoxic atmosphere (320-340 mm Hg) produces an insignificant effect on the intensity of carbon monoxide elimination, increases ammonia elimination and decreases elimination of ketones and aldehydes.

The possibility of contamination of the artificial atmosphere in tightly sealed, small-volume chambers by the gaseous products of man's vital functions has led to a series of investigations devoted to a study of the influence of physical, chemical and other environmental factors on the intensity of their formation and elimination from the body into the surrounding medium (V. V. Kuzgov, L. A. Tjunov; T. S. Kolosova, et al.).

This communication presents data on the influence exerted on these processes by the prolonged continuous presence of animals in an artificial atmosphere with an increased oxygen content.

The experiments were performed on white male rats weighing 280-300 g. The experimental animals were kept for 30 days in a pressurized chamber with a volume of 0.186 m<sup>3</sup>. The oxygen concentration in the chamber air was maintained automatically at the level - 45% (320-340 mm Hg). Carbon dioxide in the atmosphere was maintained at the level 0.3-0.5% by means of continuous pumping of chamber air through a chemical absorbent with its subsequent return to the chamber. After the animals had been confined in this chamber for 24 hours, 15 and 30 days they were transferred to a chamber with lesser volume (0.093 m<sup>3</sup>) outfitted with a heat-regulating system. The oxygen and carbon dioxide concentrations in the atmosphere of this chamber were maintained by the method described above at the same level as in the chamber

JPRS 57517

15 MAR 72

- 1 -

BELKIN, V. I.

space  
physiology

SO: SPAS 53448  
24 June 71

UDC 612.2.06:612.766.2

EFFECT OF RESTRICTED MOBILITY OF ANIMALS ON THE INTENSITY AND EXCRETION OF SOME GASEOUS PRODUCTS OF VITAL FUNCTIONS

6408051

6408051 (space physiology) 6408051

[Article by V. V. Kustov, V. I. Belkin, B. I. Noidin, T. A. Izhareva, L. P. Podubnaya and O. F. Ostapenko; Moscow, Sovetskaya Biologiya i Meditsina, 1970, Vol. 5, no 2, 1971, pp 14-17] 6408064 6408218

Abstract: It was demonstrated that 15-day reduced activity of male white rats has an insignificant effect on the elimination of ketones and aldehydes and accelerates the elimination of carbon monoxide and ammonia.

Gaseous metabolic products eliminated from the body play an important role in forming the atmosphere of small hermetically sealed spaces. The intensity of formation and elimination of these products are subject to considerable variations in dependence on the effect exerted on the body by a physical load, ambient temperature, ionizing radiation, hypoxia and other factors (S. M. Gorodinskiy, et al., 1968, 1970; V. V. Kustov and L. A. Timov; T. G. Kolosova, et al.).

This paper gives the results of a study of the effect of relative hypokinesia, one of the environmental factors in small hermetically sealed spaces, on the intensity of formation and body elimination of some endproducts of its vital functioning. The experiments were made on male white rats weighing 200 g. Hypokinetic cages, specially constructed for this purpose, were used for restricting their mobility; these held the animals for 24 hours, three and fifteen days. Upon expiration of this period the group of "hypokinetic" cages with the experimental rats were placed in a pressurized chamber with a volume of 93 liters equipped with an air conditioning system; this made it possible to create a constant temperature (18-20°C) and relative humidity (not greater than 60 percent) in the chamber and to collect the condensate for successive determination of the water-soluble substances in it. The chamber oxygen content was maintained at the 20-21 percent level. The carbon dioxide concentration did not exceed 1 percent.

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USSR

UDC: 611.43:611.1.067-019:612.014.45

RAKHIMOV, Ya. A., and BEKIN, V. Sh., Chair of Normal Anatomy, Medical Faculty, Tadjik State Medical Institute imeni Abu Ali Ibn-Siny

"Morphology of Vessels of Some Endocrine Glands in Dogs Exposed to Whole-Body Vertical Vibration"

Leningrad, Arkhiv Anatomii, Gistologii i Embriologii, Vol 59, No 11, Nov 70, pp 43-49

Abstract: The intraorgan vascular bed of the thyroid, adrenals, ovaries, and testes was studied in dogs which had been exposed to whole-body vertical vibration (4.6 Hz, amplitude 2.2 mm) for a period of 3 minutes to 10 days. The endocrine glands were studied 1, 3, 7, 15, 30, and 60 days after exposure. A high functional activity of the thyroid gland was found in dogs exposed to vibration. The adrenal glands showed a drop in lipid content in cortical layers. Dystrophic changes in the glomerular zone and enlargement of the sinusoids in the reticular zone and medullary layer of the organ were also observed. Circulatory disorders such as congestion and hemorrhages in the reticular zones were noted. The lymphatic bed volume was enlarged, and there were some indications of deformation in

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USSR

RAKHIMOV, Ya. A., and EELKIN, V. Sh., Arkhiv Anatomii, Gistologii i Embriologii, Vol 59, No 11, Nov 70, pp 43-49

in the lymphatic vascular net and its capillaries. These changes gradually disappeared 30-60 days after exposure to vibration. In the testes, distinct hemodynamic disturbances were noted within the first 3 days; spermatogenesis was depressed, and there were dystrophic changes in the seminiferous tubules; the lipid content in the spermatogenic epithelium was reduced. Intraorgan circulation was generally affected, with enlarged blood vessels and capillaries. The structure of blood vessels and lymphatic capillaries was impaired throughout, with deformed loops and extravasation. The ovaries appeared to be relatively resistant. The changes in intraorgan blood and lymph circulation are believed to be of importance in the general response of the endocrine glands to the effects of vibration.

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USSR

UDC 611.12:611.11-091:612.014.45+612.275.1

ETINGEN, L. YE., and BELKIN, V. Sh., Chair of Normal Anatomy, Therapeutic Faculty, Tadzhik State Medical Institute imeni Abu Ali Ibn-Sina

"Morphology of the Intramural Vascular Bed of the Dog Heart After Total-Body Vertical Vibration at High Altitude"

Leningrad, Arkhiv Anatomii Gistologii i Embryologii, Vol 63, No 9, 1972, pp 27-33

Abstract: Fifteen dogs were subjected to daily 30-min long vibrations (46.6 c/sec, amplitude 0.45 mm) for 10 days, beginning with the first day after delivery to Ansoh Pass (3,375 m above sea level). A second group of 15 dogs was subjected to the same vibrations after a 2-week long period of acclimatization to high altitude, while another 20 dogs served as controls. After the animals were sacrificed, dye solutions were injected into coronary blood and lymph vessels, and tissue slices were examined. In the first group, endocardial, myocardial, and epicardial lymph capillaries were enlarged up to a diameter of 120 microns and contorted into loops, and many had poorly visible walls; some lymph veins also had segmental enlargements. Myocardial blood vessels were also enlarged, and numerous blood capillaries (diameter up to 90 microns) were ruptured and surrounded by extravasated blood and dye. In these areas, the

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• USSR

ETINGEN, L. YE. and BELKIN, V. SH., Arkhiv Anatomii Gistologii i Embryologii, Vol 63, No 9, 1972, pp 27-33

myocardium was dystrophic. In the second group, the morphological changes were similar but more pronounced and further compounded by large lacunae in lymph vessels and interstitial edema. In the control animals, the pathology was less pronounced yet clearly visible. It is concluded that acclimatization is not accomplished in 2 weeks, and that the effects of hypoxia caused by vibration are augmented by the effects of hypoxia caused by high altitude.

2/2

USSR

UDC 542.91:547.1'118

ARBUZOV, B. A., BELKIN, YU. V., and POLEZHAYEVA, N. A., Chemical Institute  
Imeni A. M. Butlerov, Kazan' State University Imeni V. I. Ul'yanov-Lenin

"Reaction of Benzylidenephenylsulfonylacetophenone With Trimethyl Phosphite  
and tris(Dimethylamino)phosphine"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 5, May 73,  
pp 1107-1112

Abstract: Benzylidenephenylsulfonylacetophenone (I) reacts with trimethyl phosphite ( $80^{\circ}$ ,  $C_6H_6$ ), yielding 2,2,2-trimethoxy-3,5-diphenyl-4-phenylsulfonyl-1,2-oxaphospholene-4 (II). At high temperatures ( $160^{\circ}$ ) two processes take place concurrently: isomerization of the phosphorane (II) with formation of the dimethyl ester of 1,3-diphenyl-2-phenyl-sulfonyl-3-methoxypropene-2-phosphonic acid, and decomposition of the phosphorane (II) to yield the starting materials, accompanied by breaking of the P-C bond. Reaction of the phosphorane (II) with proton donor reagents leads to an opening of the phosphorane ring at the P-O bond, yielding the dimethyl ester of 1-phenyl-2-benzoyl-2-phenyl-sulfonylethanephosphonic acid. (I) reacts with tris(dimethylamino)-phosphine yielding a 1:1 addition product with a P-C bond and a bipolar structure.

1/1

USSR

BELKINA, L. M.

"Analysis of Errors in Arithmetic Operations Using Variable Word Length"

Kibernet. i Vychisl. Tekhn. Resp. Mezhd. Sb. [Cybernetics and Computer Technology. Republic Interdepartmental Collection], 1972, No 18, pp 44-49 (Translated from Referativnyy Zhurnal Kibernetika, No 4, 1973, Abstract No 4V622, by the author).

Translation: The rounding error with variable word length is calculated for the basic arithmetic operations in the fixed and floating point modes. Hardware rounding is proven to be necessary to decrease the mean statistical error of calculations.

1/1

USSR

UDC 518.1

VAYNSHTEYN, L. A., Corresponding Member of the Academy of Sciences USSR, and  
BEIKINA, M. G., Institute of Physical Problems imeni S. I. Vavilov of the Academy  
of Sciences USSR, Moscow

"The Double Reduction Method and Infinite Systems of Linear Equations for the  
Coefficients of an Expansion of a Required Function with Singularities"

Moscow, Doklady Akademii Nauk SSSR, Vol. 194, No 4, 1 Oct 70, pp 794-797

Abstract: A description is given of a double reduction method for the solution of  
many boundary value problems in mathematical physics, in which the solution can  
be reduced to the solution of an infinite system of linear equations

$$\sum_{n=0}^{\infty} A_{rn} X_n = C_r, \quad r = 0, 1, 2, \dots \quad (1)$$

where  $X_n$  are the coefficients of the expansion of the unknown function

$$V(x) = \sum_{n=0}^{\infty} X_n \psi_n(x) \quad (2)$$

USSR

VAYNSHTEYN, L. A. and BELKINA, M. B., Doklady Akademii Nauk SSSR, Vol 194, No 4, 1 Oct 70, pp 794-797

in terms of the total system of functions  $\psi_s(x)$ . The unknown function  $\gamma(x)$  can be, for example, the current density on an ideally conducting surface, the field components on a certain auxiliary surface which divides two regions of simple form, etc. In the double reduction method the first  $S$  coefficients  $X_s$  of the series (2) for  $s = 0, 1, \dots, S-1$  are calculated exactly as in the ordinary reduction method, but the remaining coefficients are not put equal to zero but are replaced by the asymptotic expression

$$X_s = \sum_{j=0}^{J-1} \frac{c_j}{s^{\gamma+j}} \quad (3)$$

i.e., the first  $J$  terms of the series

$$X_s = \sum_{j=0}^{\infty} \frac{c_j}{s^{\gamma+j}} \quad (4)$$

where the  $c$  coefficients  $c_0, c_1, \dots$  are unknown and the index  $\gamma > 0$  is known a priori. One thus takes into account exactly  $S$  coefficients  $X_s$  of the series

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(2) and  $J$  coefficients  $\rho_j$  of the series (4); i.e., to carry out a double reduction, as it were. The system (1) then takes the form

$$\sum_{s=0}^{S-1} A_{rs} X_s + \sum_{j=0}^{J-1} B_{rj} \rho_j = C_r, \quad r=0, 1, \dots, S+J-1,$$

where the elements of the additional matrix

$$B_{rj} = \sum_{s=0}^{\infty} \frac{A_{rs}}{s^{r+j}}, \quad r=0, 1, \dots, S+J-1, \quad j=0, 1, \dots, J-1,$$

consist of slowly converging series; since all terms of these series are known, they can be calculated. An example of the application of the method using the Ural-2 computer is given. It is noted that the ideas in this paper are closely related to those developed in an article by Neureuther and Zaki which came to the attention of the authors towards the end of work on this paper (Radio Science, Vol. 3, No. 12, 1968, p 1158).

3/1

1/2 015 UNCLASSIFIED PROCESSING DATE--11SEP70  
TITLE--CHANGE IN THE THERMAL STABILITY OF SILVER OXALATE BY ORGANIC DYE  
ADDITIVES -U-  
AUTHOR--BOLDYREY, V.V., BELKINA, R.M. *B*  
COUNTRY OF INFO--USSR  
SOURCE--KINET. KATAL. 1970, 11(1), 75-85  
DATE PUBLISHED-----70  
  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--THERMAL STABILITY, DYE, THERMAL DECOMPOSITION, SILVER  
COMPOUND, OXALATE, ADSORPTION  
  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1989/0199 STEP NO--UR/0195/70/011/001/0075/0085  
CIRC ACCESSION NO--AP0106855  
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0106855

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE STUDY WAS MADE USING 4 XANTHENE DYES, 11 AZO DYES, AND ALIZARIN RED S. ABSORPTION OF THESE DYES FROM ALC. OR AQ. SOLNS. DECREASED THE THERMAL DECOMP. OF AG OXALATE (II), WHILE MECH. I, DYE MIXTS. DID NOT AFFECT THE DECOMP. ON ADSORPTION, THE DYES FORM SURFACE COMPS. WITH AG. THESE COMPS. SHOWED INDIVIDUAL SPECTRA. THE RESULTS SHOW THE LOWER THE SOLY. OF A AG DYE COMPD. THE GREATER THE EFFECT OF THIS DYE ON STABILIZATION OF I.

UNCLASSIFIED

Photoelectric Effect

USSR

UDC 535.215.1

ALEKSANDROV, S. B., BELKIND, A. I., ALEKSANDROV, V. V., GREKHOV, V. V., NEYSHLOS, YA. D.

"Photoelectric Emission From Tetracene. Effect of the Condition of the Surface and of Brightening"

V sb. Poluprovodniki i ikh primeneniye v elektrotekhn (Semiconductors and Their Application to Electrical Engineering--Collection of Works), No 5, Riga, "Zinatne," 1971, pp 231-249 (from Radh: Elektronika i yeye primeneniye, No 2, Feb 72, Abstract No 2419)

Translation: Various mechanisms are considered of photoelectric emission from tetracene: photoionization of defects of trapped electrons, ionization of such defects by excitons and photoionization of molecules of the basic substance. An analysis is conducted of the effect of a bend [zagib] of the energy bands (BEB) on photoelectric emission: on the spectral dependence of the quantum yield, the distribution of the electrons with respect to energy, the photoelectric work function, and others. The parameters of the BEB are obtained. The photoelectric work function of the

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USSR

ALEKSANDROV, S. B., et al, V sb. Poluprovodniki i ikh primeneniye v elektrotekhn, No 5, Riga, "Zinatne," 1971, pp 231-249

tetracene (allowing for BEB) equals 5.40 plus or minus 0.05 ev. The effect is investigated of the brightening in a singlet absorption band on photoelectric emission from tetracene. 11 ill. 43 ref.

2/2

- 70 -

1/2 039 UNCLASSIFIED PROCESSING DATE--23OCT70  
TITLE--SURFACE STATE INFLUENCE ON PHOTOELECTRON EMISSION FROM  
TETRATHIOTETRACENE FILMS -U-  
AUTHOR-(02)-ALEKSANDROV, S.B., BELKIND, A.I.   
COUNTRY OF INFO--USSR  
SOURCE--LATV. PSR ZINAT. AKAD. VESTIS, FIZ. TEH. ZINAT. SER. 1970, (1),  
59-66  
DATE PUBLISHED-----70  
  
SUBJECT AREAS--MATERIALS, CHEMISTRY, PHYSICS  
  
TOPIC TAGS--SPECTRUM, ELECTRON EMISSION, ORGANIC SULFUR COMPOUND, STEEL,  
ELECTRON BEAM, IRRADIATION EFFECT, PHOTOELECTRON  
  
CONTROL MARKING--NO RESTRICTIONS  
  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1997/0669 STEP NO--UR/0371/70/000/001/0059/0066  
  
CIRC ACCESSION NO--AP0119577  
UNCLASSIFIED

2/2 039

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0119577

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE SPECTRAL DEPENDENCES OF THE QUANTUM YIELD AND THE ENERGY DISTRIBUTION OF THE ELECTRONS EMITTED FROM TETRATHIOTETRACENE (I) FILMS SMALLER THAN OR EQUAL TO 1 THICK DEPOSITED ON STEEL PLATES WERE MEASURED PRIOR TO AND AFTER IRRADIATING THE FILMS WITH AN ELECTRON BEAM (OPERATING AT AN INTENSITY OF 10 PRIME NEGATIVE 12 A AND AN ACCELERATING VOLTAGE OF 70 V FOR 1 HR) AT 80 DEGREE SK AND 5 TIMES 10 PRIME NEGATIVE 6 TORR. ON "FRESH" I SURFACES, A DOWNWARD BENDING OF ENERGY BANDS OF SIMILAR TO 0.3 EV TAKES PLACE, AND ELECTRON BEAM IRRADN. OF THE SURFACES LOWERS THE VALUE A LITTLE. THE PHOTOELEC. WORK FUNCTION FOR I UNDER THE GIVEN CONDITIONS WAS CALCD. AS 4.75 PLUS OR MINUS 0.10 EV. FACILITY: FIX.-ENERG. INST., RIGA, USSR.

TEXT ACCEPTED

USSR

UDC 539.67

POSTNIKOV, V. S., BEIKO, V. N., and SHARSHAKOV, I. M.

"Magnetomechanical Damping in Cobalt-Nickel Alloys"

Sb. "Vnutrenneye treniye v metallicheskih materialakh" (Internal Friction in Metallic Materials), Moscow, Izd-vo "Nauka," 1970, pp 191-198

Abstract: A study is made of the amplitude-dependent internal friction of nickel, cobalt, and cobalt-nickel alloys in a wide range of temperatures and deformation amplitudes. It is shown that the irreversible displacement of domain boundaries contributes mainly to damping. However, the contribution magnitude depends substantially on alloy crystalline structures, although alloys with FCC structure have a substantially larger damping value than alloys with a hexagonal close-packed structure. Phase hardening has a strong influence on damping. Prolonged annealing at a temperature close to phase transformation improves damping in alloys with a hexagonal close-packed structure. A peak appearing on internal friction characteristics of alloys with a FCC structure is explained by two simultaneous processes, i.e., magneto-mechanical hysteresis and micro-plastic deformation. 8 figures, 9 references.

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1/2 009 UNCLASSIFIED PROCESSING DATE--02OCT70  
TITLE--TECTONICS AND METAMORPHISM -U-  
AUTHOR--(02)-BELKOVA, L.N., OGNEV, V.N.  
COUNTRY OF INFO--USSR  
SOURCE--VESTNIK LENINGRADSKOGO UNIVERSITETA, NO 6, GEOLOGIYA, GEOGRAFIYA,  
1970, NR 1, PP 56-63  
DATE PUBLISHED-----70  
SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY  
TOPIC TAGS--TECTONICS, METAMORPHIC ROCK, EARTH CRUST, PRECAMBRIAN TIME  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1991/0867 STEP NO--UR/0307/70/000/001/0056/0063  
CIRC ACCESSION NO--AP0110588  
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0110589

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STRUCTURAL FORMATIONAL ANALYSIS OF CENTRAL ASIA: PRE CAMBRIANS CONFIRMS THE FOLLOWING IDEAS: 1) TECTONIC PROCESS CANNOT BE CONSIDERED AS THE CAUSE OF REGIONAL METAMORPHISM; 2) THE UNEVENNESS OF HEAT REGIME IN THE EARTH'S CRUST DURING THE PROCESS OF GENERAL DECREASE OF HEAT IN TIME GAVE RISE TO THREE EPOCHS OF REGIONAL METAMORPHISM AND THREE EPOCHS OF FOLDING ASSOCIATED WITH THEM, ARCHAEN, EARLY PROTEROZOIC AND RIFEAN. HENCE EACH OF THE PRECAMBRIAN COMPLEXES IS CHARACTERISED BY THE GRADE OF GERIONAL METAMORPHISM AND TECTONIC FEATURES, WHICH ARE SPECIFIC ONLY FOR THAT PARTICULAR COMPLEX; 3) THE FORMATION OF GNEISSIC DOMES IN CONFINED TO THE ARCHAEN EPOCH OF DIASTROPHISM AND THEY NEVER AGAIN APPEARED IN THE EARTH'S GEOLOGICAL HISTORY.

UNCLASSIFIED

Hydrobiology

USSR

UDC 612:599.537:591.185.21

KOLCHIN, S. P. and BEL'KOVICH, V. M., Institute of Developmental Biology,  
Academy of Sciences USSR, Moscow

"Tactile Sensitivity in the Common Dolphin (*Delphinus delphis*)"

Moscow, Zoologicheskiy Zhurnal, No 4, 1973, pp 620-622

Abstract: Study of 3 adult dolphins (2 male and 1 female) showed the radius of about 5 cm around the blowhole and radius of 3 to 5 cm around the palpebral fissure to be most sensitive to tactile stimulation of the skin; the threshold of sensation in these regions is less than  $10 \text{ mg/mm}^2$ . The threshold of sensation around the frontal protuberance is somewhat higher, 10 to  $20 \text{ mg/mm}^2$ . On the dorsal surface of the body caudal to the blowhole, the threshold ranges from 30 to  $40 \text{ mg/mm}^2$ . These values are similar to those found in the most sensitive regions of human skin (finger tips, eyelids, lips). They suggest that the dolphin cutaneous analyzer is capable of perceiving and discriminating hydrostatic and hydrodynamic pressure changes of 10 to 40 mm.

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Hydrobiology

USSR

UDC 534.7

BEL'KOVICH, V. M., and REZNIKOV, A. YE.

"New Findings on Echolocation in Dolphins"

Moscow, Priroda, No 11, 1971, pp 84-90

Abstract: After briefly describing the structure and functioning of the echolocation apparatus of dolphins, the authors discuss recent tank experiments in which the animals were filmed while their sounds were recorded on tape. The experiments were designed to study the interrelation of probing signals with location situations and the dynamics of change in signals in space and time. The types, duration, and frequency of the various signals were determined. Attempts were made to discover whether the variety of situations encountered by dolphins affects the operation of their location apparatus. Several theories are advanced to explain how the animals recognize objects.

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USSR

UDC 534.7

BEL'KOVICH, V. M., Candidate of Biological Sciences and NESTERENKO, YU. I.,  
Moscow

"How a Dolphin's Locator Functions"

Moscow, Priroda, No 7, 1971, pp 71-75

Abstract: Available data concerning the mechanisms of reception and emission of acoustic signals by the dolphin for the purposes of orientation, communication, and discovery of targets and obstacles are summarized. All of these functions are accomplished by means of a location apparatus, or locator. The locator is characterized by its ability to differentiate objectives, a high rate of receiving and processing of information, long and short distance resolving ability based on the acuity and field of vision, the ability to receive information from a broad space spectrum, and ability to isolate its own and external pertinent sounds from the vast number of noises in the water. Its receiving apparatus is located mainly in the highly elinnervated skin which serves as an antenna, and a very well developed acoustic apparatus. The method of generating and emitting sound signals by the dolphin has not been fully clarified. It is currently assumed, however, that sound generation is functionally linked with the outer nasal passage, a diagonal membrane,

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BEL'KOVICH, V. M., Priroda, No 7, 1971, pp 71-75

two inner valves, three pairs of air sacs, and the larynx. The sound waves are emitted by the frontal protuberance which morphologically consists of a central section of fatty cells supported by a small number of connective tissue elements, mainly in the form of fine collagen fibers. On the basis of its structure and location it may be regarded as a focusing acoustic lens readily adaptable to changing conditions. The ability of a dolphin to differentiate objectives and obstacles is based on the fact that dolphin sounds are distributed over a broad spectrum of frequencies of up to 256 kilocycles, with a 20-60 kilocycle intensity range of the sound. This broad frequency range and the well developed acoustic apparatus permit the classification of targets on the basis of their frequency and amplitude-phase characteristics. Further study of the problems connected with the reception and emission of sounds by the dolphin is urged.

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USSR

UDC 591.112:591.524.14:599.537+612.172.014.423.019

KOLCHIN, S. P., and BEL'KOVICH, V. M., Institute of Developmental Biology, Academy of Sciences USSR, Moscow

"Some Features of Cardiac Function in Dolphins"

Leningrad, Zhurnal Evolyutsionnoy Biokhimii i Fiziologii, Vol 6, No 4, Jul/Aug 70, pp 411-417

Abstract: A study was made of the EKG's of five dolphins (four *Delphinus delphis* and one *Tursiops truncatus*). The results showed that the configuration of the curve is similar to that in carnivorous animals and man. During diving, the dolphin cardiac rate slowed markedly as compared with that when the animals were on the surface or out of the water. Bradycardia during diving results from the increased "affinity" of the choline receptor for acetylcholine and from increased vagal tone. This mechanism enables the heart to adapt to overloads and function more efficiently under conditions of oxygen insufficiency. Activation of the choline receptors during diving is regarded as a nonspecific reaction (characteristic of many organisms) to asphyxia, apnea, changes in external hydrostatic pressure, and other factors. A peculiarity noted in all of the dolphins is the higher functional activity of the right heart as compared with that of terrestrial mammals.

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USSR

UDC 599.537

KOLCHIN, S. P., and BEL'KOVICH, V. M., Candidate of Biological Sciences,  
Institute of Developmental Biology, Academy of Sciences USSR Moscow

"The Functioning of the Dolphin's Heart"

Moscow, Priroda, No 11, 1970, pp 73-74

Translation: One hundred years ago, Paul Bert described the state of "reduced frequency of heart contractions" that arises in ducks while diving. This phenomenon, which has been given the name of diving bradycardia in the scientific literature, did not arise only in cases when, before diving, the ducks had been atropine, or when their vagus nerve had been severed. The conclusion was, therefore drawn that bradycardia in ducks is due to the increased tonus of the vagus nerves. By now, the phenomenon of diving bradycardia has been established in almost all vertebrates, both terrestrial and aquatic. However, the mechanisms by which bradycardia arises and its role in the system of the organism's adaptation to diving have not as yet been clarified.

In this respect, aquatic mammals -- seals and cetaceans -- the great divers, are of special interest. We investigated certain mechanisms of

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KOLCHIN, S. P. and BEL'KOVICH, V. M., Priroda, No 11, 1970, pp 73-74

bradycardia in four adult dolphins -- three common dolphins (*Delphinus delphis*) and one bottlenose dolphin (*Tursiops truncatus*). The experiments were performed in a tank with dimensions of 4 x 1, 5 x 1 meters, filled with artificially aerated sea water; water temperature was +22, +23°C, and air temperature was +25, +27°C. With the use of slings, the dolphins were kept on the surface of the water or immersed to a depth of 30-40 cm. Shifts in the frequency of heart contractions were registered by an electrocardiograph.

The heart contraction rate of dolphins varies in the following manner: during immersion in water, a marked reduction in the rate of heart contractions takes place, amounting to 50-60% of the initial rate. Immediately upon surfacing, the rate increases, sometimes exceeding the level that was observed before immersion.

According to present notions, the nervous impulses do not affect the heart directly but rather by means of the secretion of special substances -- transmitters (or mediators) of the nervous impulses -- norepinephrine and acetylcholine, from the nerve endings. The mediators interact with the formations located on the surface of the heart muscle cells, the receptors, which are probably protein molecules. As a result of this interaction, certain properties of protein molecules (their spatial orientation, etc.)

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change and, correspondingly, the state of the cells also changes. Norepinephrine intensifies the work activity of the cardiac muscle cells; acetylcholine, on the contrary, slows it down by reducing the rate of heart contractions. Consequently, if we introduce norepinephrine or acetylcholine into the blood, we can alter the rate of heart contractions in a definite direction. By changing the amount of the mediator that is administered, we can control the qualitative and quantitative shifts in the state of cardiac muscle cells which occur when the dolphins are diving or surfacing.

Experiments have shown that, under water, those receptors that react with acetylcholine are more active. Conversely, the activity of receptors interacting with norepinephrine is reduced.

At the time of surfacing, the dolphin's heart becomes more sensitive to norepinephrine and less sensitive to acetylcholine.

In this manner, during diving and surfacing, coordinated shifts occur in the activity of the adrenoreceptor and cholinoreceptor regulatory systems of dolphins; these shifts are the cause of the shifts in the rate of the heart contractions.

What is the significance of these facts? It is known that acetylcholine

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KOLCHIN, S. P., and BEL'KOVICH, V. M., Priroda, No 11, 1970, pp 73-74

intensifies assimilation processes, while epinephrine and norepinephrine intensify dissimilation processes. Acetylcholine ensures a more economical functioning of the heart together with a high efficiency of oxygen utilization. Norepinephrine, although it lowers the efficiency of oxygen utilization, increases oxygen consumption by the heart by 200-300%.

In addition, acetylcholine causes the heart to be filled more completely with blood by prolonging the period of diastole. Norepinephrine, by increasing the force and speed of cardiac contraction (the systole) also speeds up blood circulation.

Therefore, we can picture the functioning of the dolphin's heart as follows. At the time of diving, when the dolphin does not breathe, the heart functions at a slow rate and the rate of blood circulation is slower; as a consequence, the cells of the organs and tissues extract a larger amount of oxygen from the blood, and the heart itself functions more economically, with high efficiency. These phenomena are due to the increased activity of those receptors that interact with acetylcholine. At the time of surfacing, the heart begins to contract at a more rapid rate and with increased force. Blood circulation is accelerated, and this makes it possible to quickly "wash out" of the cells the waste accumulated during diving; the heart absorbs

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KOLCHIN, S. P., and Bel"KOVICH, V. M., Priroda, No 11, 1970, pp 73-74

oxygen at a great rate, replenishing the expended stores of energy.

It is much more complicated to explain the mechanism of the shift in the activity of the receptors which react to acetylcholine and norepinephrine. For the time being, it is only possible to make up more or less probable hypotheses.

Thus, on basis of our investigations, it can be stated that the adaptive reactions of the dolphin's heart to diving -- bradycardia, the shift in oxygen consumption, and others -- take place as a result of shifts in the sensitivity of the cardiovascular system to the mediators of nervous impulses: acetylcholine and norepinephrine. The significance of bradycardia is that the functioning of the heart becomes more economical.

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1/2 028 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--SPECIFIC MORPHOLOGICAL AND FUNCTIONAL FEATURES OF THE ACOUSTIC  
ORGAN IN DOLPHINS -U-  
AUTHOR--(02)-BELKOVICH, V.M., SOLNTSEVA, G.N.  
COUNTRY OF INFO--USSR  
SOURCE--ZOO ZH 49(2): 275-282. ILLUS. 1970  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--DOLPHIN, EAR, ACOUSTIC SIGNAL, SENSE ORGAN, SOUND, WHALE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--3005/1339 STEP NO--UR/0439/70/049/002/0275/0282  
CIRC ACCESSION NO--AP0133295  
UNCLASSIFIED

2/2 023

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0133295

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A STUDY OF THE ACOUSTIC ORGAN IN DELPHINUS DELPHIS AND TURSIOPS TRUNCATUS HAS SHOWN THAT ITS MORPHOLOGICAL STRUCTURE IS QUITE SIMILAR IN BOTH SPECIES AND THE SPIRAL ORGAN OF CORTI DOES NOT DIFFER FROM THAT IN MAMMALS IN HISTOLOGICAL RESPECT. THE MEATUS ACUSTICUS EXTERNUS IN DOLPHINS HAS A CONNECTIVE TISSUE OVERGROWING WHAT IS VERY IMPORTANT FOR INTERPRETATION OF THE MECHANISM OF SOUND CONDUCTION. THE RANGE OF PERCEPTION IN D. DELPHIS VARIES FROM 0.018 TO 280 KHZ. THE PERIPHERAL PART OF ACOUSTIC ANALYZATOR IN WHALES WAS SHOWN TO BE OF VALUE FOR THE DIRECTED AND INDEPENDENT RECEPTION OF SIGNAL TO EACH EAR, SWITCHING OFF THE MIDDLE EAR AT THE MOMENT OF SIGNAL DELIVERY, CONTRIVING BY INTENSITY, PRODUCTION OF PRIMARY SELECTION BY SPECTRAL CHAKACTERS.

FACILITY: INST. DEVELOP. BIOL., ACAD. SCI. USSR, MOSCOW, USSR.

UNCLASSIFIED

1/2 023 UNCLASSIFIED PROCESSING DATE--16OCT70  
TITLE--STEADY POTENTIALS AND THE REST CURRENT OF A SKELETAL MUSCLE -U-  
AUTHOR--BELKOVSKIY, E.E.  
COUNTRY OF INFO--USSR *B*  
SOURCE--FIZIOLOGICHESKIY ZHURNAL SSSR IMENI I. M. SECHENOVA, 1970, VOL 56,  
NR 3, PP 354-358  
DATE PUBLISHED-----70  
  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--FROG, MUSCLE PHYSIOLOGY, POTASSIUM CHLORIDE, ELECTRODE  
  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1982/1603 STEP NO--UR/0239/70/056/003/0354/0358  
CIRC ACCESSION NO--AP0052798  
UNCLASSIFIED

2/2 023

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0052798

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. POTENTIALS OF THE FROG'S M. GASTROCNEMIUS WERE LEAD WITH THREE NON POLARIZING ELECTRODES FROM: A) INTACT MUSCLE SURFACE, B) PHALANX BONE OF THE OPPOSITE LEG AND C) COAGULATED MUSCLE AREA. THE U SUBAB STEADY POTENTIAL DID NOT CHANGE AT REST, WHILE THE U SUBCB AND U SUBAC THESE DECREASED. INJECTION OF THE POTASSIUM CHLORIDE SOLUTION DEPOLARIZED THE MUSCLE, WHILE DENERVATION OR ATPH ADMINISTRATION HYPERULARIZED IT. DURING DEVELOPING DEPOLARIZATION AND HYPERPOLARIZATION THE U SUBAB ELECTRO POSITIVITY AND THE U SUBCB ELECTRO NEGATIVITY CHANGED CORRESPONDINGLY. THE REST POTENTIAL (DEMARKATION POTENTIAL) U SUBAC EQUALS U SUBAB PLUS U SUBCB. THE U SUBAB STEADY POTENTIAL DURING DEPOLARIZATION AND HYPERPOLARIZATION WAS TWICE AS SMALL AS THE OSCILLATION AMPLITUDE OF THE U SUBAC REST POTENTIAL. FACILITY: O. V. KUUSINEN'S UNIVERSITY, PETROZAVODSK.

UNCLASSIFIED



USSR

UDC 581.132.08

BELL, I. N.

"Application of Photocalorimetry for Investigating the Energy Metabolism of Photosynthesis"

Moscow, Biofizicheskiye Metody V Fiziologii Rasteniy, Nauka, 1971, pp 106-129

Translation: The article reviews the application of photocalorimetry for investigating the energy metabolism of photosynthesis. It is pointed out that the shortcoming of the indirect method of determining the energy metabolism of photosynthesis (according to gas exchange) is the necessity of knowing the chemistry of the process. The direct method of burning the dry mass of the plants is unsuitable in most physiological investigations, because its sensitivity is small and therefore the results are not quite accurate. The photocalorimetric method, in which the amount of light energy converted into heat is measured, is convenient in cases when the energy balance of the plants is not affected by transpiration.

Photocalorimeters used by various investigators are analyzed, and their shortcomings and advantages are pointed out.

The "temperature curve method" proposed by the author is thoroughly analyzed. This method is based on the correlation existing between the plant's temperature and the intensity of light falling on it, and on deter-  
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BELL, L. N., *Biofizicheskiye Metody v Fiziologii Rasteniy*, Nauka, 1971, pp 106-129

mining the energy output according to the slopes of the temperature curve at low and optimum light intensity for photosynthesis. The photocalorimetric setup operating on the temperature curve method is described, the basic parameters of the equipment are specified, and some results obtained with that equipment are given.

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USSR

UDC 581.132

SHUVALOVA, N. P., and BELL, L. N., Institute of Plant Physiology imeni K. A. Timiryazev, Academy of Sciences USSR, Moscow

"The Effect of Blue Light on the Energy Yield of Chlorella Photosynthesis, as Measured in the Red Region of the Spectrum"

Moscow, Doklady Akademii Nauk SSSR, Vol 194, No 5, 1970, pp 1,223-1,225

Abstract: An attempt was made to determine whether blue light, which changes the structure of chloroplasts, can increase the energy yield of photosynthesis as measured in red light. A Chlorella pyrenoidosa suspension maintained at a temperature of 34-38°C and subjected to controlled light irradiation served as the test object. Energy yield was measured with a photocalorimeter in monochromatic red light and in red light against a blue background. The results obtained indicate that blue light has a regulating effect on the photoenergy of Chlorella. In experiments carried out during the summer, it was found that the energy yield in red light increased under the influence of a relatively strong background of blue light. In experiments during the fall and winter, blue light reduced the energy yield in red light. The observed effect of blue light may be responsible for the abnormally high energy yield previously observed in the blue-green region of the spectrum.

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USSR

UDC: 62-501.7

BELLAN, Yu. M.

"Method of Composing Minimal Test and Diagnostic Sequences for Discrete Systems"

Mekhaniz. i Avtomatiz. Upr. Nauch-Proizv. Sb. [Mechanization and Automation of Control; Scientific and Production Collection], 1971, No 5, pp 41-45 (translated from Referativnyy Zhurnal Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 3, 1972, Abstract No 3 A336 by A. B.)

Translation: The use of mathematical methods for synthesis of logic devices allows minimum checking and diagnostic tests to be composed for the detection of defective logic units (LU). For single-cycle LU, the checking tests are made up from the table of states using a graph of transitions. For multi-cycle LU, the most convenient method of representation of initial information is a compressed table of conversions, based on compact recording of the functioning algorithm. A method of composing checking tests is described. 3 figures; 6 tables.

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USSR

UDC: 621.382.333.33.001.15

BELLAVIN, V. K., URITSKIY, V. Ya.

"On the Density of Surface States at the Si-SiO<sub>2</sub> Interface in MDS-Structures"

Moscow, Radiotekhnika i Elektronika, Vol 17, No 4, Apr 72, pp 889-890

Abstract: The paper presents the results of a study of the effect which heating MDS-structures has on the density of states localized at the Si-SiO<sub>2</sub> interface. The potential difference between the metal electrode and the silicon body is held constant. Phosphorus-doped n-silicon and boron-doped p-silicon specimens were studied. It was found that the density of states is not altered by heating without biasing or with positive biasing. The density of states close to the middle of the forbidden band is increased by heating with negative biasing. However, it was also found that cooling MDS-structures to 77°K brings about a reduction in the density of states close to the corresponding edge of the forbidden band.

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USSR

UDC 539.1.074.3

BELLE, YU. S., LEBEDEV, O. V., SPIRIN, V. D.

"The Background of Scintillation Detectors and Ways of Decreasing It"

Khar'kov, Monokristally, Stsintillyatory i Organicheskiye Lyumino-  
fory -- Sbornik (Monocrystals, Scintillators, and Organic Lumino-  
phores -- Collection of Works), No 5, 1970, pp 148-155 (from  
Referativnyy Zhurnal, Metrologiya i Izmeritel'naya Tekhnika, No  
12, 1970, Abstract No 12.32.1534)

Translation: Research has been conducted on the nature and con-  
tribution of various background sources for a detector with an  
NaI (Tl) crystal with dimensions of 150x100 mm. On the basis of  
measurements of the contents of potassium and radium in the  
glass of photoelectric multiplier 1B, photoelectric multiplier  
2B, photoelectric multiplier 49, photoelectric multiplier 52, and  
photoelectric multipliers 56 of various years' models, it was  
established that the admixture of radium in sodium glass is  
responsible for 70-80% of the background from these photoelectric  
1/2

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USSR

BELLE, YU. S., et al, Monokristally, Stsintillyatory i Organi-  
cheskiye Lyuminofory -- Sbornik, No 5, 1970, pp 148-155

multipliers. Ways for the penetration of radium into the glass of photoelectric multipliers and other materials are shown. An estimate is made of the contribution of the  $\gamma$ -radiation of radioactive admixtures contained in the material of the crystal, the container, the body of the detector and its shielding, into the detector background. It is shown that the most favorable material for making low-background shielding of large volume is cast-iron shielding 15-20 cm thick. Ways are proposed for further reduction of detector background. 1 figure, 3 tables, 2 bibliographic entries.

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1/2 015 *B* UNCLASSIFIED PROCESSING DATE--11SEP70  
TITLE--REAGENT ANTIFOAMING AGENT UNSULFONATED COMPOUNDS -U-  
AUTHOR--BELLER, N.N., KURSHANOVA, Z.I., SAMUSEVA, L.P., CHERNYSHEVA, I.M.,  
VOINOV, L.G.  
COUNTRY OF INFO--USSR  
SOURCE--TR., KUIBYSHEV. NAUCH. ISSLED. INST. NEFT. PROM. 1969, NO. 41,  
56-62  
DATE PUBLISHED-----69  
SUBJECT AREAS--MATERIALS, EARTH SCIENCES AND OCEANOGRAPHY  
TOPIC TAGS--ANTIFOAM ADDITIVE, SURFACE ACTIVE AGENT, CHEMICAL WASTE  
CONVERSION, WELL DRILLING MACHINERY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1989/1542 STEP NO--UR/0000/69/000/041/0056/0052  
CIRC ACCESSION NO--AT0107962



2/2 - 015

UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AT0107962

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE USE OF UNSULFONATED COMPOS., (A) CONTAINED IN WASTE LIQUORS (FROM MANUF. OF ALKYLARENESULFONATES), AS ANTIFOAMING ADDITIVES IN DRILLING MUDS, TREATED PREVIOUSLY WITH VARIOUS SURFACTANTS (KSF, SULFANOL, ETC.), IS DESCRIBED. A ARE DARK BROWN LIQS., SP. GR. 0.84, DECOMP. 240DEGREES, WITH OH NO. 60-80, ACID NO. 1.5-3.5, CARBONATE NO. 20-30, AV. ALC. CONTENT 27-30PERCENT, ACIDS 1.5-2PERCENT, KETONES 10-12PERCENT, ESTERS 5-7PERCENT, OLEFINS 27-8PERCENT, AND SATD. HYDROCARBONS 23-7PERCENT. A, ADDED AT 0.1-0.3PERCENT (RELATED TO THE VOL. OF DRILLING FLUIDS) WERE, IN LAB. AND LARGE SCALE EXPTS., BETTER ANTIFOAMING AGENTS THAN FUSEL, CASTOR, OR ROSIN OILS, AL STEARATE, OR HIGHER FATTY ALCs.; THEY LOWER THE AIR IN THE FOAM TO 1-3PERCENT AND RESTORE THE SP. GR. OF THE SOLN. FROM 0.58 TO 1.32 AND CAN BE USED WITHOUT ANY SOLVENT.

1/2 016

UNCLASSIFIED

PROCESSING DATE--23OCT70

TITLE--EFFECT OF AMINO ALCOHOLS AND AMINES ON THE KINETICS OF VINYL  
ACETATE PHOTOPOLYMERIZATION. II. INFLUENCE OF DIETHYLAMINE ETHANOL IN THE  
AUTHOR--(03)-CHALTYKYAN, D.A., MELKONYAN, R.G., BELLERYAN, N.M.

COUNTRY OF INFO--USSR

SOURCE--ARM. KHIM. ZH. 1970, 23(2), 119-23

DATE PUBLISHED-----70

B

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--AMINO ALCOHOL, AMINE, PHOTOPOLYMERIZATION, POLYVINYL ACETATE,  
ETHANOL, METHANOL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRA--1999/1772

STEP NO--UR/0426/70/023/002/0119/0123

CIRC ACCESSION NO--AP0123569

UNCLASSIFIED

2/2 016

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0123569

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE PHOTOPOLYMN. RATE (W) OF H SUB2 C:CHDAC (I) INCREASES WITH THE CONCN. OF THE ADDED ET SUB2 NCH SUB2 CH SUB2 OH (II) IN A NON LINEAR FASHION. WHEN MEQH IS ALSO ADDED TO I, W CHANGES LINEARLY WITH II CONCN. II, BESIDES INCREASING W, ACTS AS THE CHAIN TRANSFER AGENT. THE CHAIN TRANSFER CONST. (KAPPA) DEPENDENCE ON THE TEMP. IS EXPRESSED BY  $KAPPA = A \exp(\frac{-15200}{RT})$ , WHERE A IS 7.8 TIMES 10 PRIME11 WHEN BOTH II AND MEQH ARE PRESENT; A IS 5.3 TIMES 10 PRIME NEGATIVE11 WHEN ONLY II IS PRESENT. FACILITY: EREVAN. GOS. UNIV., EREVAN, USSR.

UNCLASSIFIED

USSR

UDC: 621.396.69:621.372.54(088.8)

BEL'MAN, M. Kh., BLINOV, B. V., KUKHAR', V. V., GOLOVIZNINA, N. V.,  
RAZUMOVA, T. A.

"An Electromechanical Filter"

USSR Author's Certificate No 270125, filed 10 Dec 68, published 30 Jul 70  
(from RZh-Radiotekhnika, No 1, Jan 71, Abstract No 1V345 P)

Translation: An electromechanical filter is proposed with a T-shaped resonance element whose ends fit into gaps in magnetic systems of input and output converters interconnected by two permanent magnets. To improve the thermal stability of the filter, shunts of thermomagnetic alloy are connected in parallel with the permanent magnets.

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USSR

UDC 678.746.45.01:537.226

TROSTYANSKAYA, YE. B., BEL'NIK, A. R., CHERNIKOVA, O. D., and POYMANOV, A. M.,  
Moscow Aviation Technology Institute

"Causes of Resite Property Changes in Aqueous and Alkaline Media"

Kiev, Fiziko-Khimicheskaya Mekhanika Materialov, Vol 9, No 2, 1973, pp 37-40

Abstract: The degree of effect of low-molecular polar impurities on the properties of resite was investigated by comparing the characteristics of the initial material with its characteristics after extended aqueous extraction at room temperature. Equilibrium sorption, coefficient of diffusion, dielectric loss, and modulus of elasticity of the resite were measured for different degrees of relative humidity. With increased relative humidity and in water the effect of resite plastification by the absorbed water is spanned by swelling stresses. The presence of low-molecular polar impurities in the resite leads to a sharp growth of swelling stresses and dielectric losses while the strain on the polymeric lattice and volume of absorbed water vapor are lowered. Resite breakdown in aqueous solutions of an alkali occurs under the action of swelling stresses which grow sharply as a result of increased hydrophilicity from replacement of hydrogen in the phenol chains by metal ions. 3 figures, 1 table, 11 bibliographic references.

1/1

1/2 031 UNCLASSIFIED PROCESSING DATE--020CT70  
TITLE--CHANGE IN THE STRUCTURE AND PROPERTIES OF HARDENED RESINS UNDER THE  
INFLUENCE OF A FILLER. 2. INFLUENCE OF A FILLER ON THE INTERACTION  
AUTHOR--(04)-POIMANOV, A.M., TROSTYANSKAYA, YE.B., NOSOV, YE.F., BELNIK,  
A.F.  
COUNTRY OF INFO--USSR **B**  
SOURCE--MEKH. POLIM. 1970, 6(1), 54-8  
DATE PUBLISHED-----70  
SUBJECT AREAS--MATERIALS  
TOPIC TAGS--FILLER, EPOXY RESIN, MECHANICAL STRENGTH, PRESSURE EFFECT,  
ENTROPY, THERMAL EXPANSION, ELASTIC MODULUS, COMPRESSIVE STRENGTH  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1992/1899 STEP NO--UR/0374/70/006/001/0054/0053  
CIRC ACCESSION NO--AP0112879  
UNCLASSIFIED

2/2 031

UNCLASSIFIED

PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0112879

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE INCREASE IN THE MECH. STRENGTH OF EPOXY RESINS (I) CAUSED BY THE ADDN. OF FILLERS (QUARTZ OR GLASS POWDERS) WAS CORRELATED WITH THE INCREASE OF THE INTERNAL PRESSURE ( $P_{SUBINT}$ ) OF THE SYSTEM.  $P_{SUBINT}$  EQUAL  $(\Delta U - \Delta V)_{SUBT}$  AND CONFORMS TO THE THERMODYNAMIC RELATION:  $P$  EQUALS  $T (\Delta S - \Delta V)_{SUBT} - P_{SUBINT}$  (WHERE  $P$ ,  $T$ ,  $V$ ,  $S$ , AND  $U$  ARE, RESP., EXTERNAL PRESSURE, TEMP., VOL. ENTROPY, AND INTERNAL ENERGY). ALSO  $P_{SUBINT}$  EQUALS  $T \alpha K - P$  ( $\alpha$  IS THE THERMAL EXPANSION COEFF. AND  $K$  IS THE VOL. ELASTICITY MODULUS, BOTH BEING DETERMINABLE EXPTL.) AND THUS IT CAN BE DETD. BY EXPT. IT WAS SHOWN THAT THE COMPRESSION STRENGTH OF FILLED I INCREASES LINEARLY WITH THE INCREASE IN  $P_{SUBINT}$  AND THE AMT. OF THE FILLER.

UNCLASSIFIED

USSR

UDC 513.831

BEL'NOV, V. K. *B*

"Metric Expansions. 1"

Moscow, Vestnik Moskovskogo Universiteta, Matematika, Mekhanika; No 4, 1970,  
pp 60-65

Abstract: The structure of a partially ordered set  $M$  of all complete metric expansions of some fixed, noncompact metric space  $X$  is studied. Necessary and sufficient conditions are found under which space  $X$  has complete metric expansions with zero-dimensional growth.

1/1



Acc. Nr:

AP0051125

Abstracting Service:

CHEMICAL ABST. 5-70

Ref. Code:

4R 0528

97582p Enzymic formation of hydrogen sulfide in *Brucella*.  
Belobab, V. I.; Studentsov, K. P.; Krasov, V. M. (USSR).  
*Vestn. Sel'skokhoz. Nauki (Alma-Ata)* 1969, 12(11), 47-52  
(Russ). Strains of *Brucella abortus*, *B. melitensis*, and *B. suis* formed H<sub>2</sub>S from L-cysteine enzymically. H<sub>2</sub>S formation in *Brucella* is of an inductive nature and the synthesis mechanism is affected according to the organizer hypothesis of Monos and Emerson. The enzyme cysteine desulphydrase was obsd. in several standard allergens.  
Rebecca Lyon

REEL/FRAME

19811168

USSR

UDC 531.44.669.35

BELOBORODOV, I. I., KOLESNICHENKO, L. F., NENAKHOV, A. V., and YUGA, A. I.,  
Institute of Problems of the Material Science of the Academy of Sciences  
UkrSSR

"Investigation of Antifriction Properties of Bronze-Base Materials"

Kiev, Poroshkovaya Metallurgiya, No 11(131), Nov 73, pp 91-93

Abstract: The technology of the production of bronze-base metalloplastic antifriction materials with a high content of solid lubricant is described. The antifriction properties were studied on specimens with a highly porous (50%) bronze shell, produced from Cu (90%) and Sn(10%) powders and impregnated with a mix of fluoroplast-4 with 30% graphite. The results of investigations carried out in air at a sliding rate of 6 m/sec and loads of up to 60 kg/cm<sup>2</sup> show that materials with 50% porosity based on non-spherical powders possess a high fatigue life independent of the presence of a solid lubricant surface layer. The antifriction properties of materials with 30% porosity based on spherical powders do not deteriorate when the surface layer is eliminated. Metalloplastic materials based on non-spherical powders with a higher content of solid lubricant are recommended for working under conditions of friction without lubrication. Four figures, one table, five bibliographic references.  
1/1

1/2 020 UNCLASSIFIED PROCESSING DATE--04DEC70  
TITLE--INFLUENCE OF SODIUM SULFIDE ADDITIVES ON THE ELECTROCHEMICAL  
BEHAVIOR OF FUSED TIN SULFIDE -U-  
AUTHOR-(02)-VELIKANOV, A.A., BELOBORODOV, I.I.

COUNTRY OF INFO--USSR

SOURCE--UKR. KHIM. ZH. 1970, 36(4), 351-6

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY, MATERIALS, PHYSICS

TOPIC TAGS--SEMICONDUCTOR MATERIAL, ELECTRICAL PROPERTY, THERMAL EFFECT,  
TIN SULFIDE, SODIUM SULFIDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAE--3008/0367

STEP NO--UR/0073/70/036/004/0351/0356

CIRC ACCESSION NO--AP0137471

UNCLASSIFIED

2/2 020 UNCLASSIFIED PROCESSING DATE--04DEC70  
CIRC ACCESSION NO--AP0137471  
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TABLES OF SP. COND. AND OF THE  
TEMP. COEFF. OF COND. ARE GIVEN FOR VARIOUS SNS-NA AUB2 S MIXTS. AT  
750-1050DEGREES. AT ALL TEMPS., THE MIN. COND. WAS AT A COMPN. CLOSE TO  
47.81 MOLE PERCENT NA SUB2 S. AT 680DEGREES, THE MAX. CURRENT YIELD OF  
SN WAS 32.3PERCENT OBTAINED WITH A C.D. OF 1.5 A-CM. NO SIGNS OF  
LIBERATION OF NA WERE OBSD. THE ADDN. OF NA SUB2 S UP TO A LIMIT  
DECREASES THE NONIONIC COND. OF THE SEMICONDUCTOR WITH INCREASE OF THE  
COND. OWING TO IONS AND INCREASE IN SN DEPOSITION. FACILITY:  
KIEV. GOS. UNIV. IM. SHEVCHENKO, KIEV, USSR.

UNCLASSIFIED